WHAT IS CLAIMED IS:

1.   A method of constructing an abstract discrete system suitable for formal analysis from a hybrid system, with respect to a property of interest, said method comprising the steps of:

a) selecting a set of polynomials from the polynomials contained in the property of interest and the hybrid system;

b) saturating the selected set of polynomials;

c) constructing the abstract discrete system over a set of abstract states defined by the positive, negative and zero valuation of the saturated set of polynomials.

2.   A method as in claim 1 wherein the step of saturating the selected set of polynomials is stopped before normal termination.

3.   A method as in claim 1, wherein the hybrid system has no discrete components.

4.   A method as in claim 1 wherein eigenvectors are used to generate polynomials.

5.   A method for determining the validity of a property of interest with respect to a hybrid system, said method comprising the steps of:

a) abstracting the hybrid system to create an abstract discrete system;

b) analyzing the validity of the property of interest with respect to the abstract discrete system.

6.   The method of claim 5, further comprising:

c) where the property of interest is invalid with respect to the abstract discrete system, creating a finer abstraction of the hybrid system and analyzing the property of interest with respect to the finer abstraction.

7.   The method of claim 5, wherein analyzing the validity of the property of interest is performed by model checking.

8.   The method of claim 5, wherein the hybrid system is a model of a biological system.

9.   The method of claim 5, wherein the hybrid system is a model of a biological

organism.